

**REQUEST FOR PARTICIPATION IN THE PATENT PROSECUTION HIGHWAY (PPH) PILOT PROGRAM  
BETWEEN THE JPO, AND THE USPTO**

Application No.: 10/574,478

First Named Inventor: Yoshihide KAWAGUCHI, et al

Filing Date: April 3, 2006

Attorney Docket No.: Q93964

Title of the Invention: Photochemically Refractive-Index-Changing Polymer, Photochemically Refractive-Index-Changing Polymer Composition, And Method of Refractive Index Regulation

**THIS REQUEST FOR PARTICIPATION IN THE PPH PILOT PROGRAM ALONG WITH THE REQUIRED DOCUMENTS MUST SUBMITTED VIA EFS-WEB.**

**INFORMATION REGARDING EFS-WEB IS AVAILABLE AT [HTTP://WWW.USPTO.GOV/EFB/EFB\\_HELP.HTML](http://www.uspto.gov/efc/efs_help.html).**

**APPLICANT HEREBY REQUESTS PARTICIPATION IN THE PATENT PROSECUTION HIGHWAY (PPH) PILOT PROGRAM AND PETITIONS TO MAKE THE ABOVE-IDENTIFIED APPLICATION SPECIAL UNDER THE PPH PILOT PROGRAM.**

The above-identified application (1) validly claims priority under 35 U.S.C. 119(a) and 37 CFR 1.55 to one or more corresponding JPO application(s) or to a PCT application that does not contain any priority claim, or (2) is a national stage entry of a PCT application that does not contain any priority claim.

**The JPO/PCT application number(s) is/are:** JP-A-2004-274513 (now JP Patent No. 3,718,518)

**The filing date of the JPO/PCT application(s) is/are:** September 22, 2004

**I. List of Required Documents:**

**a. A copy of all JPO office actions in the above-identified JPO application(s).**

☒ Is attached.

☐ Is available via Dossier Access System. Applicant hereby requests that the USPTO obtain these via the Dossier Access System.

*"It is not necessary to submit a copy of the "Decision to Grant a Patent" and an English translation thereof.*

**b. A copy of all claims which were determined to be patentable by the JPO in the JPO application(s).**

☒ Is attached.

☐ Is available via Dossier Access System. Applicant hereby requests that the USPTO obtain these via the Dossier Access System.

**c. English translations of the documents in a. and b. above along with a statement that the English translations are accurate are attached (if the documents are not in the English language).**

**d. (1) An information disclosure statement listing the documents cited in the JPO office actions**

☐ Is attached.

☐ Has already been filed in the above-identified U.S. application on \_\_\_\_\_

☒ No reference was cited in the corresponding Japanese application.

**c. (2) Copies of all documents (except for U.S. patents or U.S. patent application publications)**

☐ Is attached.

☐ Have already been filed in the above-identified U.S. application on \_\_\_\_\_

☒ No reference was cited in the corresponding Japanese application.

**REQUEST FOR PARTICIPATION IN THE PATENT PROSECUTION HIGHWAY (PPH) PILOT PROGRAM  
BETWEEN THE JPO, AND THE USPTO**

(continued)

Application No.:	10/574,478	First Named Inventor:	Yoshihide KAWAGUCHI, et al
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**II. Claims Correspondence Table:**

Claims in US Application	Patentable Claims in JPO Application	Explanation regarding the correspondence
1 (amended)	1	Sufficiently corresponds to the English translation of allowed claim 1 of the JP application.
2 (original)	2	Sufficiently corresponds to English translation of allowed claim 2 of the JP application.
3 (canceled)		
4 (amended)	3	Sufficiently corresponds to the English translation of allowed claim 3 of the JP application except that US claim 4 is not multiply dependent.
5 (amended)	4	Sufficiently corresponds to the English translation of allowed claim 3 of the JP application except that US claim 5 is not multiply dependent.
6 (original)	5	Sufficiently corresponds to English translation of allowed claim 5 of the JP application.
7 (amended)	6	Sufficiently corresponds to the English translation of allowed claim 6 of the JP application except that US claim 7 is not multiply dependent.
8 (amended)	7	Sufficiently corresponds to the English translation of allowed claim 7 of the JP application.
9 (original)	8	Sufficiently corresponds to the English translation of allowed claim 8 of the JP application.
10. (canceled)		
11. (amended)	9	Sufficiently corresponds to the English translation of allowed claim 9 of the JP application except that US claim 11 is not multiply dependent.
12. (amended)	10	Sufficiently corresponds to the English translation of allowed claim 10 of the JP application except that US claim 12 is not multiply dependent.
13. (original)	11	Sufficiently corresponds to the English translation of allowed claim 8 of the JP application.
14. (amended)	12	Sufficiently corresponds to the English translation of allowed claim 12 of the JP application except that US claim 14 is not multiply dependent.
15. (original)	13	Sufficiently corresponds to the English translation of allowed claim 13 of the JP application.
16. (original)	14	Sufficiently corresponds to the English translation of allowed claim 14 of the JP application.
17. (amended)	15	Sufficiently corresponds to the English translation of allowed claim 15 of the JP application.
18. (original)	16	Sufficiently corresponds to the English translation of allowed claim 16 of the JP application.

**III. All the claims in the US application sufficiently correspond to the patentable/allowable claims in the JPO application.**

**REQUEST FOR PARTICIPATION IN THE PATENT PROSECUTION HIGHWAY (PPH) PILOT PROGRAM  
BETWEEN THE JPO, AND THE USPTO (continued)**

Application No.:

10/574,478

First Named Inventor:

Yoshihide KAWAGUCHI, et al

**IV. Payment of Fees:**

The Commissioner is hereby authorized to charge the petition fee under 37 CFR 1.17(h) as required by 37 CFR 1.102(d) to ☒ Deposit Account No. 19-4880

☒ The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

☐ Credit Card. Credit Card Payment Form (PTO-2038) is attached.

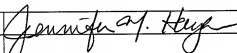
SEND ALL CORRESPONDENCE TO:  
The address associated with Customer Number:

WASHINGTON OFFICE

**65565**

CUSTOMER NUMBER

Signature



Date

March 27, 2008

Name

(Print/Typed)

Jennifer M. Hayes

Registration

Number

40,641

**PATENT APPLICATION**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of

Docket No: Q93964

Yoshihide KAWAGUCHI, et al.

Appln. No.: 10/574,478

Group Art Unit: 1732

Confirmation No.: 2362

Examiner: Not Yet Assigned

Filed: April 3, 2006

For: PHOTOCHEMICALLY REFRACTIVE-INDEX-CHANGING POLYMER,  
PHOTOCHEMICALLY REFRACTIVE-INDEX-CHANGING POLYMER, AND  
METHOD OF REFRACTIVE INDEX REGULATION

**Copy of the allowed claims of Japanese Application 2004-274513 (as  
issued in Japanese Patent No, 3,718,518)**

**(3 PAGES)**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

(19) 日本国特許庁(JP)

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G02 B	1/04	G02 B	1/04
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請求項の数 16 (全 25 頁) 最終頁に続く

(21) 出願番号	特願2004-274513 (P2004-274513)	(73) 特許権者	000003964
(22) 出願日	平成16年9月22日(2004.9.22)		日東電工株式会社
(65) 公開番号	特開2005-126688 (P2005-126688A)		大阪府茨木市下穂積1丁目1番2号
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最終頁に続く

(54) 【発明の名称】 光屈折率変調重合体、光屈折率変調重合体組成物および屈折率制御方法

(57) 【特許請求の範囲】

【請求項1】

(a) つぎの式(1)：



(式中、 $\text{R}^1$  は水素原子またはメチル基、 $\text{R}^2$  は炭素数1～20の不飽和炭化水素基であって、分子内にヘテロ原子やハロゲン原子を含んでもよい)

で表されるアクリル・ビニル単量体のホモ重合体、(b)式(1)で表されるアクリル・ビニル単量体の2種以上の共重合体、または(c)式(1)で表されるアクリル・ビニル単量体の1種または2種以上とこれ以外の単量体の1種または2種以上との共重合体のいずれかの重合体であって、分子内にラジカル重合性の側鎖ビニル基が残存しており、放射線を照射したときの屈折率増加( $\Delta n$ )が照射前後で0.005以上(m-line法によるTEモードで測定)であることを特徴とする光屈折率変調重合体。

【請求項2】

分子内にラジカル重合性の側鎖ビニル基が90%以上残存している請求項1に記載の光屈折率変調重合体。

【請求項3】

立体規則性が、シンジオタクティシティー (r r) で 70% 以上である請求項 1 または 2 に記載の光屈折率変調重合体。

【請求項 4】

放射線が紫外線である請求項 1 ～ 3 のいずれかに記載の光屈折率変調重合体。

【請求項 5】

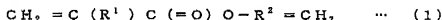
紫外線を  $10 \text{ J/cm}^2$  以下の照射光量で照射したときの屈折率増加 ( $\Delta n$ ) が照射前後で 0.005 以上 (m-line 法による TE モードで測定) である請求項 4 に記載の光屈折率変調重合体。

【請求項 6】

請求項 1 ～ 5 のいずれかに記載の光屈折率変調重合体と、光開始剤、増感剤、連鎖移動剤の中から選ばれる少なくとも 1 種を含み、放射線を照射したときの屈折率増加 ( $\Delta n$ ) が照射前後で 0.005 以上 (m-line 法による TE モードで測定) であることを特徴とする光屈折率変調重合体組成物。

【請求項 7】

(a) つぎの式 (1) ;



(式中、 $\text{R}^1$  は水素原子またはメチル基、 $\text{R}^2$  は炭素数 1 ～ 20 の不飽和炭化水素基であって、分子内にヘテロ原子やハロゲン原子を含んでもよい)

で表されるアクリル・ビニル単量体のホモ重合体、(b) 式 (1) で表されるアクリル・ビニル単量体の 2 種以上の共重合体、または (c) 式 (1) で表されるアクリル・ビニル単量体の 1 種または 2 種以上とこれ以外の単量体の 1 種または 2 種以上との共重合体のいずれかの重合体であって、分子内にラジカル重合性の側鎖ビニル基が残存している重合体と、光開始剤、増感剤、連鎖移動剤の中から選ばれる少なくとも 1 種を含み、放射線を照射したときの屈折率増加 ( $\Delta n$ ) が照射前後で 0.005 以上 (m-line 法による TE モードで測定) であることを特徴とする光屈折率変調重合体組成物。

【請求項 8】

重合体は、分子内にラジカル重合性の側鎖ビニル基が 90% 以上残存している請求項 7 に記載の光屈折率変調重合体組成物。

【請求項 9】

重合体は、立体規則性がシンジオタクティシティー (r r) で 70% 以上である請求項 7 または 8 に記載の光屈折率変調重合体組成物。

【請求項 10】

放射線が紫外線である請求項 6 ～ 9 のいずれかに記載の光屈折率変調重合体組成物。

【請求項 11】

紫外線を  $10 \text{ J/cm}^2$  以下の照射光量で照射したときの屈折率増加 ( $\Delta n$ ) が照射前後で 0.005 以上 (m-line 法による TE モードで測定) である請求項 10 に記載の光屈折率変調重合体組成物。

【請求項 12】

請求項 1 ～ 5 のいずれかに記載の光屈折率変調重合体または請求項 6 ～ 11 のいずれかに記載の光屈折率変調重合体組成物に対し、放射線を照射することにより、屈折率増加 ( $\Delta n$ ) が照射前後で 0.005 以上 (m-line 法による TE モードで測定) とすることを特徴とする屈折率制御方法。

【請求項 13】

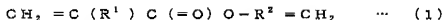
放射線が紫外線である請求項 12 に記載の屈折率制御方法。

【請求項 14】

紫外線の照射光量が  $10 \text{ J/cm}^2$  以下である請求項 13 に記載の屈折率制御方法。

## 【請求項 15】

(a)' つぎの式 (1) ;

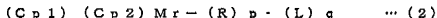


(式中、 $\text{R}^1$  は水素原子またはメチル基、 $\text{R}^2$  は炭素数 1 ~ 20 の不飽和炭化水素基であって、分子内にヘテロ原子やハロゲン原子を含んでいてもよい)

で表されるアクリル・ビニル単量体の 1 種、(b)' 式 (1) で表されるアクリル・ビニル単量体の 2 種以上、または (c)' 式 (1) で表されるアクリル・ビニル単量体の 1 種または 2 種以上とこれ以外の単量体の 1 種または 2 種以上のいずれかである単量体を、重合開始剤として、希土類金属を活性中心とする金属錯体触媒を使用して、アニオン重合させることにより、請求項 1 ~ 5 のいずれかに記載の光屈折率変調重合体を得ることを特徴とする光屈折率変調重合体の製造方法。

## 【請求項 16】

希土類金属を活性中心とする金属錯体触媒は、つぎの式 (2) ;



(式中、 $\text{Cp}1$ 、 $\text{Cp}2$  は、相互に独立して、非置換のシクロペンタジエニルまたは置換されたシクロペンタジエニルであり、 $\text{Cp}1$  と  $\text{Cp}2$  とは直接または連結基を介して結合していてもよい。 $\text{Mr}$  は  $r$  価の希土類金属原子で  $r$  は 2 ~ 4 の整数である。 $\text{R}$  は水素原子または炭素数 1 ~ 3 の直鎖アルキル基である。 $\text{L}$  は配位能を有する溶媒である。 $p$  は  $\text{R}$  の数、 $q$  は  $\text{L}$  の数で、それぞれ 0 ~ 2 の整数であり、上記  $r$  に対して  $r = p + 2$  となるように選択される。)

で表される金属錯体化合物である請求項 15 に記載の光屈折率変調重合体の製造方法。

【発明の詳細な説明】

【技術分野】

【0001】

本発明は、紫外線などの放射線を照射することにより屈折率が増加する光屈折率変調重合体ないし光屈折率重合体組成物とこれらの屈折率制御方法とに関する。

【背景技術】

【0002】

従来、光ファイバをはじめ、光回折格子、光メモリ、光集積回路などの種々の光デバイスの研究開発が盛んである。これらの光デバイスの材料として、最近では、加工性、柔軟性などにすぐれるポリマー材料が注目されている。

【0003】

光デバイスの作製に当たっては、デバイス中の屈折率を精密かつ任意に制御する技術が必要不可欠である。このような技術として、たとえば、無機材料の場合には、ゲルマニウムをドーブしたガラスに光を照射することにより、屈折率を変化させて、光回折格子を作製する方法が知られている。

【0004】

ポリマー材料の場合には、光化学反応活性な低分子をポリマー中に分散させた材料に対してレーザ光を照射して、フォトリソミック反応 (フォトブリーチング) を誘起し、それに伴い屈折率を変化させて光回折格子を作製する技術が開示されている (特許文献 1 参照)。また、上記フォトブリーチングを利用して、屈折率が材料中で連続的に変化した、いわゆる屈折率分布型材料 (GRIN 材料) を製造する技術も開示されている (特許文献 2 参照)。

**PATENT APPLICATION**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of

Docket No: Q93964

Yoshihide KAWAGUCHI, et al.

Appln. No.: 10/574,478

Group Art Unit: 1732

Confirmation No.: 2362

Examiner: Not Yet Assigned

Filed: April 3, 2006

For: PHOTOCHEMICALLY REFRACTIVE-INDEX-CHANGING POLYMER,  
PHOTOCHEMICALLY REFRACTIVE-INDEX-CHANGING POLYMER, AND  
METHOD OF REFRACTIVE INDEX REGULATION

**English translation of the allowed claims of Japanese Application  
No. 2004-274513 (now JP Patent No. 3,718,518) together with the  
Statement that the English translation is accurate**

**(8 PAGES)**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450



## DECLARATION

I, Koji YOKOKAWA—of 7 - 13, Nishi - Shimbashi 1 - chome,  
Minato - ku, Tokyo 105 - 8408 Japan—hereby declare that I am  
conversant in both Japanese and English and that I believe the  
following is a true and correct translation of Claims of Japanese  
Patent No. 3,718,518.

Date: January 7, 2008

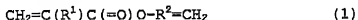
  
Koji YOKOKAWA

English Translation of Claims of

Japanese Patent No. 3,718,518

1. A photochemically refractive-index-changing polymer, which is one of

(a) a homopolymer comprising an acrylic vinyl monomer represented by the following formula (1):



(wherein  $\text{R}^1$  is a hydrogen atom or a methyl group and  $\text{R}^2$  is a saturated or unsaturated hydrocarbon group having 1-20 carbon atoms, provided that the monomer may have one or more heteroatoms and one or more halogen atoms in the molecule),

(b) a copolymer comprising two or more of the acrylic vinyl monomers represented by the formula (1), or

(c) a copolymer comprising one or two or more of the acrylic vinyl monomers represented by the formula (1) and one or two or more monomers other than the acrylic vinyl monomers, and

wherein said polymer has a radical-polymerizable side-chain vinyl group remaining in the molecule and, upon irradiation with a radiation, undergoes a refractive-index increase ( $\Delta n$ ) through the irradiation of 0.005 or more (as measured by the m-Line method in the TE mode).

2. The photochemically refractive-index-changing

polymer according to claim 1, wherein 90% or more of the radical-polymerizable side-chain vinyl groups remain in the molecule.

3. The photochemically refractive-index-changing polymer according to claim 1 or 2, which has a stereoregularity of 70% or higher in terms of syndiotacticity (rr).

4. The photochemically refractive-index-changing polymer according to any one of claims 1 to 3, wherein the radiation is ultraviolet.

5. The photochemically refractive-index-changing polymer according to claim 4, which upon irradiation with ultraviolet in an irradiation dose of  $10 \text{ J/cm}^2$  or less, undergoes a refractive-index increase ( $\Delta n$ ) through the irradiation of 0.005 or more (as measured by the m-Line method in the TE mode).

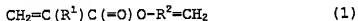
6. A photochemically refractive-index-changing polymer composition, which comprises the photochemically refractive-index-changing polymer according to any one of claims 1 to 5 and at least one member selected from a photoinitiator, a sensitizer, and a chain transfer agent and, upon irradiation with a radiation, undergoes a

refractive-index increase ( $\Delta n$ ) through the irradiation of 0.005 or more (as measured by the m-Line method in the TE mode).

7. A photochemically refractive-index-changing polymer composition, which comprises:

a polymer which is one of

(a) a homopolymer comprising an acrylic vinyl monomer represented by the following formula (1):



(wherein  $\text{R}^1$  is a hydrogen atom or a methyl group and  $\text{R}^2$  is a saturated or unsaturated hydrocarbon group having 1-20 carbon atoms, provided that the monomer may have one or more heteroatoms and one or more halogen atoms in the molecule),

(b) a copolymer comprising two or more of the acrylic vinyl monomers represented by the formula (1), or

(c) a copolymer comprising one or two or more of the acrylic vinyl monomers represented by the formula (1) and one or two or more monomers other than the acrylic vinyl monomers,

said polymer having a radical-polymerizable side-chain vinyl group remaining in the molecule; and

at least one member selected from a photoinitiator, a sensitizer, and a chain transfer agent, and

wherein upon irradiation with a radiation, the

composition undergoes a refractive-index increase ( $\Delta n$ ) through the irradiation of 0.005 or more (as measured by the m-Line method in the TE mode).

8. The photochemically refractive-index-changing polymer composition according to claim 7, wherein the polymer has 90% or more of the radical-polymerizable side-chain vinyl groups remaining in the molecule.

9. The photochemically refractive-index-changing polymer composition according to claim 7 to 8, wherein the polymer has a stereoregularity of 70% or higher in terms of syndiotacticity (rr).

10. The photochemically refractive-index-changing polymer composition according to any one of claims 6 to 9, wherein the radiation is ultraviolet.

11. The photochemically refractive-index-changing polymer composition according to claim 10, which upon irradiation with ultraviolet in an irradiation dose of 10 J/cm<sup>2</sup> or less, undergoes a refractive-index increase ( $\Delta n$ ) through the irradiation of 0.005 or more (as measured by the m-Line method in the TE mode).

12. A method of refractive index regulation, which

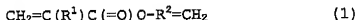
comprises irradiating the photochemically refractive-index-changing polymer according to any one of claims 1 to 5 or the photochemically refractive-index-changing polymer composition according to any one of claims 6 to 11 with a radiation to thereby cause the polymer or composition to undergo a refractive-index increase ( $\Delta n$ ) through the irradiation of 0.005 or more (as measured by the m-Line method in the TE mode).

13. The method of refractive index regulation according to claim 12, wherein the radiation is ultraviolet.

14. The method of refractive index regulation according to claim 13, wherein the irradiation dose of ultraviolet is 10 J/cm<sup>2</sup> or less.

15. A process for producing a photochemically refractive-index-changing polymer, which comprises subjecting a monomer which is

(a)' an acrylic vinyl monomer represented by the following formula (1):



(wherein  $\text{R}^1$  is a hydrogen atom or a methyl group and  $\text{R}^2$  is a saturated or unsaturated hydrocarbon group having 1-20 carbon atoms, provided that the monomer may have one or more heteroatoms and one or more halogen atoms in the

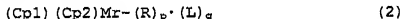
molecule),

(b)' two or more of the acrylic vinyl monomers represented by the formula (1), or

(c)' one or two or more of the acrylic vinyl monomers represented by the formula (1) and one or two or more monomers other than the acrylic vinyl monomers

to anionic polymerization using as a polymerization initiator a metal complex catalyst including a rare earth metal as an active center to thereby obtain the photochemically refractive-index-changing polymer according to any one of claims 1 to 5.

16. The process for producing a photochemically refractive-index-changing polymer according to claim 15, wherein the metal complex catalyst including a rare earth metal as an active center is a metal complex compound represented by the following formula (2):



(wherein Cp1 and Cp2 each independently is an unsubstituted cyclopentadienyl or a substituted cyclopentadienyl, provided that Cp1 and Cp2 may be bonded to each other directly or through a connecting group; Mr is a rare earth metal atom having a valence of r, provided that r is an integer of 2-4; R is a hydrogen atom or a linear alkyl group having 1-3 carbon atoms; L is a solvent having a coordinating ability; and p is the number of R's

and  $q$  is the number of L's,  $p$  and  $q$  each being an integer of 0-2 and selected so as to satisfy the following relationship with the  $r$ :  $r=p+2$ ).



**PATENT APPLICATION**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of

Docket No: Q93964

Yoshihide KAWAGUCHI, et al.

Appln. No.: 10/574,478

Group Art Unit: 1732

Confirmation No.: 2362

Examiner: Not Yet Assigned

Filed: April 3, 2006

For: PHOTOCHEMICALLY REFRACTIVE-INDEX-CHANGING POLYMER,  
PHOTOCHEMICALLY REFRACTIVE-INDEX-CHANGING POLYMER, AND  
METHOD OF REFRACTIVE INDEX REGULATION

**English translation of Office Action dated April 19, 2005 together  
with Statement**

**Office Action dated April 19, 2005 issued in Japanese Application  
No. 2004-274513**

**(6 PAGES)**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

## DECLARATION

I, Koji YOKOKAWA—of 7 - 13, Nishi - Shimbashi 1 - chome,  
Minato - ku, Tokyo 105 - 8408 Japan—hereby declare that I am  
conversant in both Japanese and English and that I believe the  
followings are true and correct translations of two Office Actions  
issued in Japanese Patent Application No. 2004 - 274518.

Date: January 7, 2008

A handwritten signature in black ink, appearing to read 'Koji Yokokawa', written over a horizontal line.

Koji YOKOKAWA

Ref. No. PE1-DA5316

Mailing No. 140209

Mailing date: April 19, 2005

NOTICE FOR REASONS OF REJECTION

Patent Application No.: Patent Application 2004-274513

Drafting date: April 13, 2005

Examiner of Patent Office: Shuji Sasaki 8930 4J00

Agent of Patent Applicant: Mr. Kunio Negimoto

Applicable articles of the law: Article 36

The application is to be rejected because of following reasons. In the case of an opinion thereon, submit a written opinion within 60 days from the mailing date of this notice.

REASONS

In the application, the description of claims does not satisfy, in the following points, the requirements set forth in Patent Law, article 36, paragraph 6, item 2.

EXPLANATION

\* Claims 1, 8 and 17

\* Remarks

The invention of claims 1 is an invention relating

to a refractive-index-changing polymer, namely a high-molecular weight compound.

In general, in order to specify a high-molecular weight compound, required are constitutional components and a compositional ratio thereof, and physical properties if necessary.

However, this claim only specifies the component of the formula (1) but does not clarify other components contained and compositional ratio thereof, so that, as a result, the entire structure as the high-molecular weight compound is not clarified.

Therefore, the invention of claim 1 is not clear.

The same applies to the descriptions on the high-molecular weight compound in claims 8 and 17.

For the inventions of claims other than those pointed out in the present notice for reasons of rejection, reasons for rejection are not found at present. In case reasons for rejection are found anew, such reasons for rejection will be notified.

- - - - -

Record of search result on prior technical references

\* Searched field IPC 7th edition C08F 20/20-40

G02B 1/04

Destination of enquiry on the content of this Notice  
for Reasons of Rejection:

Patent Examination Div. 3, polymer: Examiner Shuji  
Sasaki

Tel: 03(3581)1101 ext. 3456

Fax: 03(3592)6877

拒絶理由通知書



特許出願の番号	特願2004-274513		
起案日	平成17年 4月13日		
特許庁審査官	佐々木 秀次	8930	4J00
特許出願人代理人	祢▲ぎ▼元 邦夫 様		
適用条文	第36条		

この出願は、次の理由によって拒絶をすべきものである。これについて意見があれば、この通知書の発送の日から60日以内に意見書を提出して下さい。

特許庁提出期限  
 17.6.20

理 由

御回答希望期限  
 17.5.30

この出願は、特許請求の範囲の記載が下記の点で、特許法第36条第1項第2号に規定する要件を満たしていない。



記

- ・請求項 1, 8, 17
- ・備考

請求項1に係る発明は、光屈折率変調重合体すなわち高分子化合物に関する発明である。

一般に高分子化合物を特定するためには、構成される成分およびその組成比、さらに必要であれば物性値が必要である。

しかるに、当該請求項は、式(1)である成分を特定するにとどまり、他どのような成分を有し、それらの組成比が明らかになっておらず、結果として高分子化合物として全体構造が明らかになっていない。

よって、請求項1に係る発明は明確でない。

また、請求項8および17の高分子化合物に関する記載部分も同様である。

この拒絶理由通知書中で指摘した請求項以外の請求項に係る発明については、現時点では、拒絶の理由を発見しない。拒絶の理由が新たに発見された場合には拒絶の理由が通知される。

先行技術文献調査結果の記録

・調査した分野 IPC第7版 C08F 20/20-40,

整理番号 PE1-DA5316

発送番号 140209 2/E

発送日 平成17年 4月19日

G02B 1/04,

G02B 6/00-12

この拒絶理由通知の内容に関するお問い合わせ先

特許審査第三部高分子 佐々木 秀次

TEL. 03 (3581) 1101 内線3456

FAX. 03 (3592) 6877

**PATENT APPLICATION**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of

Docket No: Q93964

Yoshihide KAWAGUCHI, et al.

Appln. No.: 10/574,478

Group Art Unit: 1732

Confirmation No.: 2362

Examiner: Not Yet Assigned

Filed: April 3, 2006

For: PHOTOCHEMICALLY REFRACTIVE-INDEX-CHANGING POLYMER,  
PHOTOCHEMICALLY REFRACTIVE-INDEX-CHANGING POLYMER, AND  
METHOD OF REFRACTIVE INDEX REGULATION

**English translation of Office Action dated June 21, 2005 together  
with copy of Statement**

**Office Action dated June 21, 2005 issued in Japanese Application  
No. 2004-274513**

**(6 PAGES)**


Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450



## DECLARATION

I, Koji YOKOKAWA—of 7 - 13, Nishi - Shimbashi 1 - chome,  
Minato - ku, Tokyo 105 - 8408 Japan—hereby declare that I am  
conversant in both Japanese and English and that I believe the  
followings are true and correct translations of two Office Actions  
issued in Japanese Patent Application No. 2004 - 274513.

Date: January 7, 2008

A handwritten signature in black ink, appearing to read 'Koji Yokokawa', written over a horizontal line.

Koji YOKOKAWA

Ref. No. PE1-DA5316

Mailing No. 216553

Mailing date: June 21, 2005

NOTICE FOR REASONS OF REJECTION

Patent Application No.: Patent Application 2004-274513

Drafting date: June 10, 2005

Examiner of Patent Office: Shuji Sasaki 8930 4J00

Agent of Patent Applicant: Mr. Kunio Negimoto

Applicable articles of the law: Article 36

The application is to be rejected because of following reasons. In the case of an opinion thereon, submit a written opinion within 60 days from the mailing date of this notice.

REASONS

In the application, the description of claims does not satisfy, in the following points, the requirements set forth in Patent Law, article 36, paragraph 6, item 2.

EXPLANATION

\* Claims 1, 8 and 17

\* Remarks

As regards the acryl-vinyl monomer represented by

the formula (1), it is not clear what kind of group is represented by the substituent  $R^2$ .

For example, in case that the number of carbon atoms is 1, the saturated group is absent if  $R^2=CH_2$  is considered as unsaturated, and the saturated group is absent in case that the number of carbon atoms is 2 or more. Further, in consideration of paragraphs [0027] to [0028], the presence of a vinyl group is essential, so that it may be rather considered as  $-R^{2'}-CH=CH_2$  (wherein  $R^{2'}$  is a saturated hydrocarbon group having 0 to 8 carbon atoms). In any case, the structure of a part containing the substituent  $R^2$  is unclear.

Therefore, the invention of claims 1, 8 and 17 is not clear.

In case of making an amendment, it should be made within the extent of the description in the original specification.

For the inventions of claims other than those pointed out in the present notice for reasons of rejection, reasons for rejection are not found at present. In case reasons for rejection are found anew, such reasons for rejection will be notified.

- - - - -

Destination of enquiry on the content of this Notice  
for Reasons of Rejection:

Patent Examination Div. 3, polymer: Examiner Shuji  
Sasaki

Tel: 03(3581)1101 ext. 3456

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## 拒絶理由通知書



特許出願の番号 特願2004-274513  
起案日 平成17年 6月10日  
特許庁審査官 佐々木 秀次 8930 4J00  
特許出願人代理人 称▲ぎ▼元 邦夫 様  
適用条文 第36条

この出願は、次の理由によって拒絶をすべきものである。これについて意見があれば、この通知書の発送の日から60日以内に意見書を提出して下さい。

特許庁提出期限

17.8.22

理 由

御回答希望期限

17.8.1

この出願は、特許請求の範囲の記載が下記の点で、特許法第36条第6項第2号に規定する要件を満たしていない。

## 記

・請求項 1, 8, 17

・備考

式(1)で表されるアクリル・ビニル単量体について、置換基 $R^2$ は、具体的などのような基を示すのか明らかでない。

例えば、炭素数1の場合、 $R^2 = CH_2$  を不飽和と見れば、飽和基は存在しないし、炭素数2以上も飽和基は存在しないことになる。また、段落【0027】-【0028】を参照すると、ビニル基が存在することが必須であることから、むしろ $-R^2 - CH=CH_2$  (ただし、 $R^2$  は炭素数0~8の飽和炭化水素基)とも考えられる。いずれにしても、置換基 $R^2$ を含む部分の構造が不明確である。

よって、請求項 1, 8, 17に係る発明は明確でない。

なお、補正される際には、当初明細書に記載された範囲で補正されたい。

この拒絶理由通知書中で指摘した請求項以外の請求項に係る発明については、現時点では、拒絶の理由を発見しない。拒絶の理由が新たに発見された場合には拒絶の理由が通知される。

-----  
この拒絶理由通知の内容に関するお問い合わせ先

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TEL. 03 (3581) 1101 内線3456

整理番号 PE1-DA5316

発送番号 216553 2/E

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